

Patent Claims

1. Procedure for supplying the dialyser of a dialysis unit with dialysing fluid, whereby the following steps are followed:

Making available at least one dialysing fluid concentrate (K1, K2) in at least one receiving unit,

making available water (W) for diluting the dialysing fluid concentrate,

mixing the dialysing fluid concentrate and water in a pre-set volumetric ratio to prepare the dialysing fluid supplying the dialysing fluid to the dialyser of the dialysis unit at a pre-set dialysing fluid flow rate over a pre-set treatment time T_B ,

characterised in that

the dialysing fluid flow rate Q_d is set at a value which depends upon the presence of a pre-set volume of dialysing fluid concentrate at the commencement of the dialysis treatment, the pre-set volumetric proportions of the dialysing fluid concentrate and water and the pre-set treatment time during the dialysis treatment such that at the end of the treatment the receiving unit is either empty or it contains a pre-set residual volume of dialysing fluid concentrate.

2. Procedure in accordance with claim 1, characterised in that the dialysing fluid flow rate Q_{dB} is determined before the commencement of the dialysis treatment from the pre-set volume of dialysing fluid concentrate at the commencement of the dialysis treatment, the pre-set volumetric proportions and the pre-set treatment time and that this flow rate is maintained over the whole treatment time so that at the end of the treatment time the receiving unit is either empty or it contains a pre-set residual volume of dialysing fluid concentrate.

3 Procedure in accordance with claim 1 or 2, characterised in that, for a test of the dialysis unit before commencement of the dialysis treatment, the quantity of dialysing fluid concentrate in the receiving unit before commencement of the dialysis treatment is determined over a pre-set time interval T_{test} from the pre-set quantity of dialysing fluid concentrate at the start of the treatment and the quantity used up during the pre-set time

interval..

4. Procedure in accordance with any one of claims 1 to 3, characterised in that over a pre-set time interval T_{B1} of the dialysis treatment a pre-set dialysing fluid flow rate Q_{d_b} is determined whereby the amount of dialysing fluid concentrate remaining in the receiving unit at the end of the time interval can be calculated from the pre-set amount of dialysing fluid concentrate at the commencement of the dialysis treatment and the amount of dialysing fluid concentrate used during the dialysis treatment and in that at the end of the pre-set time interval T_{B1} the dialysing fluid flow rate Q_{d_v} is determined from the quantity of dialysing fluid concentrate in the receiving unit, the pre-set volumetric ratio and the remaining treatment time where Q_{d_v} is the rate of flow required to be set for the remaining treatment time in order to ensure that at the end of the treatment the receiving unit will be either empty or will contain the pre-set residual amount of dialysing fluid concentrate.

5. Procedure in accordance with any one of claims 1 to 4 characterised in that the pre-set residual volume of dialysing fluid concentrate remaining at the end of the treatment time is discharged to waste.

6. Procedure in accordance with claim 5, characterised in that the pre-set residual volume of dialysing fluid concentrate is diluted with water in a pre-set volumetric ratio before the residual volume is discharged to waste.

7. Procedure in accordance with any one of claims 1 to 4, characterised in that no residual volume of dialysing fluid concentrate remains in the receiving unit.

8. Equipment for supplying a dialyser of a dialysis unit with dialysing fluid with

at least one receiving unit (12, 13) for at least one dialysing fluid concentrate (K1, K2),

means (38) for providing the availability of water (W) for dilution of the dialysing fluid concentrate,

means (15, 17, 18, 20) for mixing the dialysing fluid concentrate and water in a pre-set volumetric ratio to prepare the dialysing fluid,

means (11) to conduct the dialysing fluid to the dialyser of the dialysis unit at a pre-set dialysing fluid flow rate over a pre-set treatment period,

characterised in that a control and calculating unit (24) is provided which is so designed that the dialysing fluid flow rate Q_d - which is dependent upon the pre-set quantity of dialysing fluid concentrate present at the commencement of the dialysis treatment, the pre-set volumetric ratio between dialysing fluid concentrate and water, and the pre-set treatment period can be adjusted during the dialysis treatment in such a way that at the end of the treatment the receiving unit is either completely empty or it contains a pre-set residual amount of concentrate.

9. Equipment in accordance with claim 8, characterised in that the control and calculating unit (24) is so designed that from the pre-set quantity of dialysing fluid concentrate present at the commencement of the dialysis treatment, the pre-set volumetric ratio and the pre-set treatment time it is possible to determine the dialysing fluid flow rate Q_{db} before the commencement of the dialysis treatment, this flow rate being capable of adjustment over the entire treatment period in order that at the end of that period the receiving unit (12, 13) is either empty or it contains the pre-set residual amount of dialysing fluid concentrate.

10. Equipment in accordance with claim 8 or 9, characterised in that the control and calculating unit (24) is so designed that, for the purposes of a test of the dialysing equipment lasting a pre-set time interval of T_{test} before the commencement of the dialysis treatment it is possible to determine the amount of dialysing fluid concentrate in the receiving unit (12, 13) from the pre-set amount of dialysing fluid concentrate present at the commencement of the treatment and the amount of dialysing fluid concentrate used during the pre-set time interval.

11. Equipment in accordance with any one of claims 8 to 10, characterised in that the control and calculating unit (24) operates in association with the means (15, 17, 18, 20) to mix the dialysing fluid concentrate and water in such a manner that during a pre-set time interval T_{B1} of the dialysing treatment it is possible to set a pre-set dialysing fluid flow rate Q_{db} whereby it is possible to determine the amount of dialysing fluid concentrate remaining in the receiving unit (12, 13) from the pre-set amount of dialysing fluid concentrate at the commencement of the dialysing treatment and the amount of dialysing fluid concentrate used

and that at the end of the pre-set time interval T_{B1} it is possible to determine the dialysing fluid flow rate Q_{d_v} from the amount of dialysing fluid concentrate remaining in the receiving unit, the pre-set volume ratio and the remaining treatment time where Q_{d_v} is the rate-of flow of the dialysing fluid required to ensure that at the end of the treatment the receiving unit is either empty or contains the pre-set residual amount of dialysing fluid concentrate.

12. Equipment in accordance with any one of claims 8 to 11, characterised in that means (26, 28; 30, 31) are provided to discharge to waste the residual amount of dialysing fluid from the receiving unit (12, 13) via a waste discharge outlet (10) whereby the control and calculating unit (24) works in association with the means for discharging the residual amount of dialysing fluid in such a manner that at the end of the dialysis treatment the pre-set residual amount is capable of being discharged to the waste outlet.

13. Equipment in accordance with any one of claims 8 to 12 characterised in that means (27) for mixing the residual amount of dialysing fluid with water in a pre-set volume ratio are provided whereby the control and calculating unit (24) operates in association with the means for mixing the residual amount of the dialysing fluid with water in such a manner that the residual amount can be diluted with water before the residual amount is discharged through the waste outlet (10).

14. Equipment in accordance with any one of claims 8 to 11, characterised in that no residual amount of dialysing fluid remains in the receiving unit (12, 13).

15. Equipment in accordance with any one of claims 8 to 14, characterised in that means (25) are provided for inputting the data relevant to the pre-set amount of dialysing fluid concentrate in the receiving unit (12, 13), to the pre-set volume ratio of dialysing fluid concentrate and water and to the pre-set treatment time.